

9.5 The Rectangle Method for Finding Area

Lesson objectives

Students will apply space and dimensional shapes of geometry by finding the areas of polygons using the rectangle method.

STUDY LINK
9.4

More Area Problems

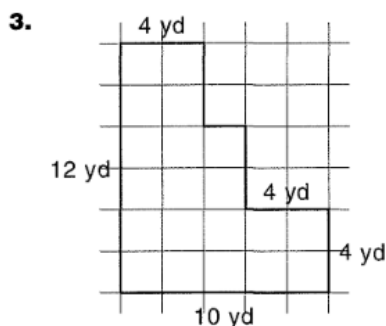


1. Rashid can paint 2 square feet of fence in 10 minutes. Fill in the missing parts to tell how long it will take him to paint a fence that is 6 feet high by 25 feet long. Rashid will be able to paint

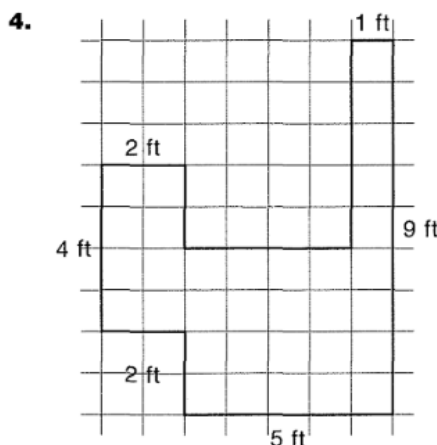
_____ of fence in _____.
(area) (hours/minutes)

2. Regina wants to cover one wall of her room with wallpaper. The wall is 9 feet high and 15 feet wide. There is a doorway in the wall that is 3 feet wide and 7 feet tall. How many square feet of wallpaper will she need to buy?

Calculate the areas for the figures below.

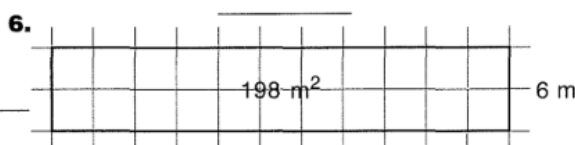
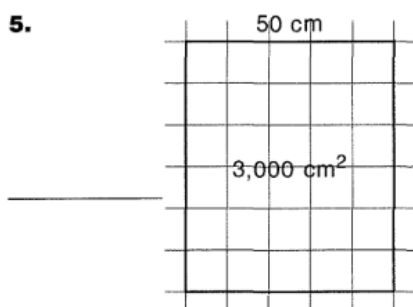


Area = _____ yd^2



Area = _____ ft^2

Fill in the missing lengths for the figures below.





Mental Math



Solve the extended multiplication facts

5 (80s)

Click on box to reveal the answers.



Mental Math



Solve the extended multiplication facts

$$\begin{array}{r} 70 \text{ (60s)} \\ 4 \overline{) 280} \\ \underline{28} \\ 0 \end{array}$$

Click on box to reveal the answers.



Mental Math



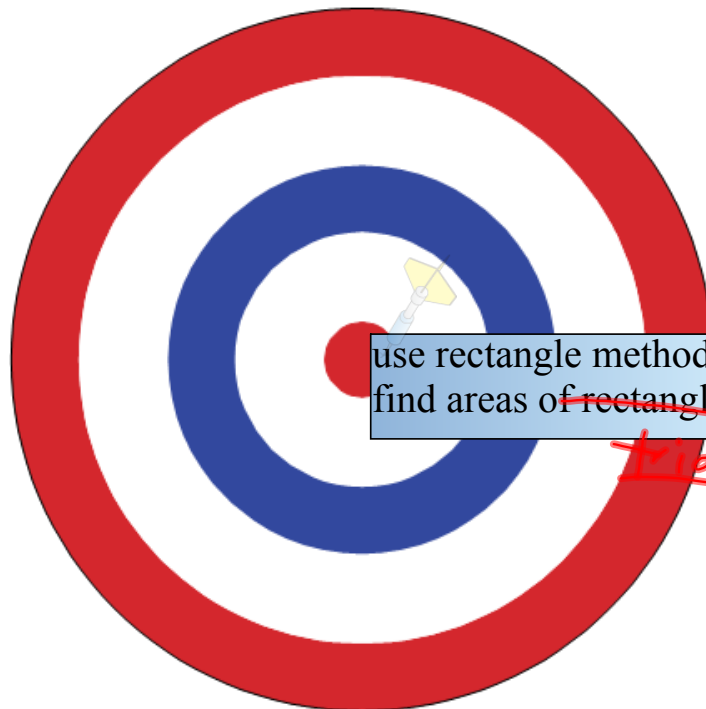
Solve the extended multiplication facts

$$\begin{array}{r} 900 \text{ (40s)} \\ \times 40 \\ \hline 36,000 \end{array}$$

Click on box to reveal the answers.



Our goal for today



use rectangle method to
find areas of ~~rectangles~~

triangles



Math Messge

Work with a partner to complete journal page 308.



Personal references are familiar objects whose sizes approximate standard measures. For example, the distance across the tip of many people's smallest finger is about 1 centimeter. You identified personal references for length, weight, and capacity in *Fourth Grade Everyday Mathematics*.

Look around your workspace or classroom to find common objects that have areas of 1 square inch, 1 square foot, 1 square yard, 1 square centimeter, and 1 square meter. The areas do not have to be exact, but they should be reasonable estimates. Work with your group. Try to find more than one reference for each measure.



Math Messge

Work with a partner to complete journal page 308.



Unit	My Personal References
1 square inch (1 in ²)	
1 square foot (1 ft ²)	
1 square yard (1 yd ²)	
1 square centimeter (1 cm ²)	
1 square meter (1 m ²)	



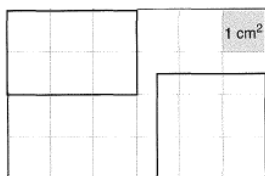
Finding Areas of a Nonrectangular Figures

Page 309

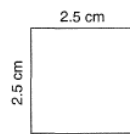
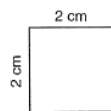


In the previous lesson, you calculated the areas of rectangular figures using two different methods.

- ◆ You counted the total number of unit squares and parts of unit squares that fit neatly inside the figure.



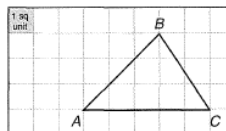
- ◆ You used the formula $A = b * h$, where the letter A stands for area, the letter b for the length of the base, and the letter h for the height.

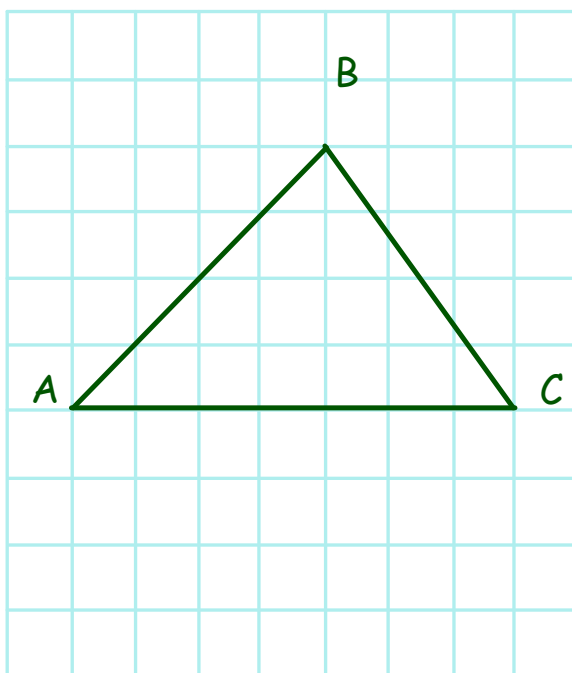


However, many times you will need to find the area of a figure that is not a rectangle. Unit squares will not fit neatly inside the figure, and you won't be able to use the formula for the area of a rectangle.

Working with a partner, think of a way to find the area of each of the figures below.

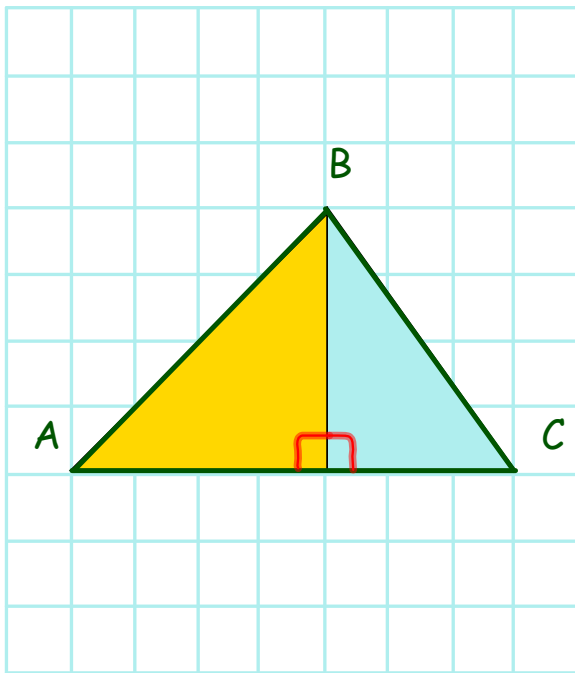
1. What is the area of triangle ABC ?





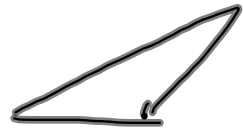
How do we
determine the area
of this triangle?

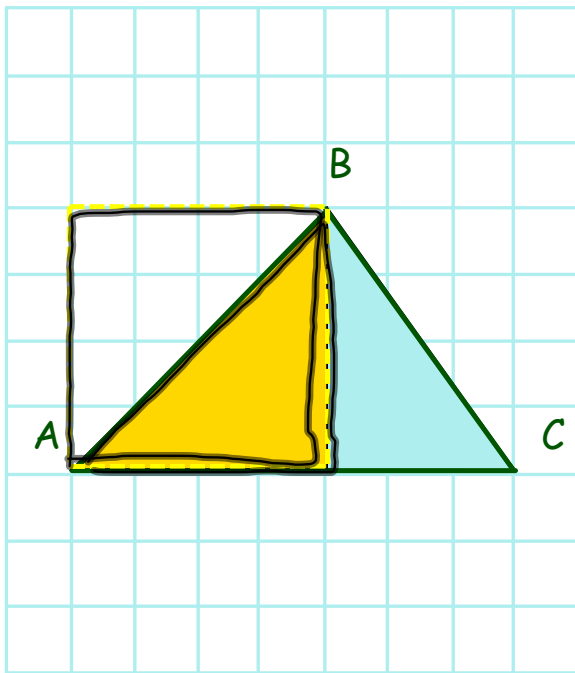
- a. 10.5cm^2
- b. 11cm^2
- c. 10cm^2



Step 1

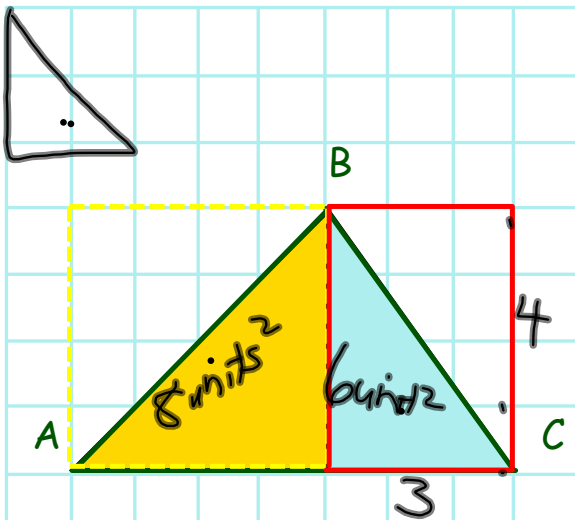
Split the
triangle into
two right
triangles.





What do we
know about the
triangle inside
the rectangle

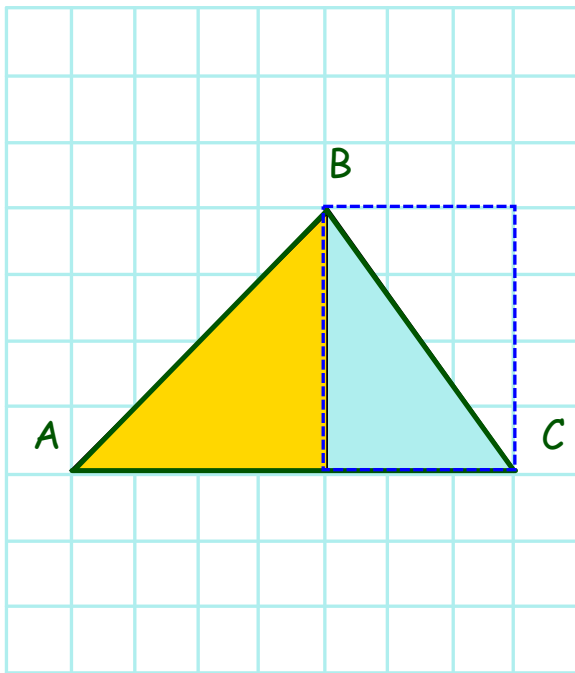
?



14 units²

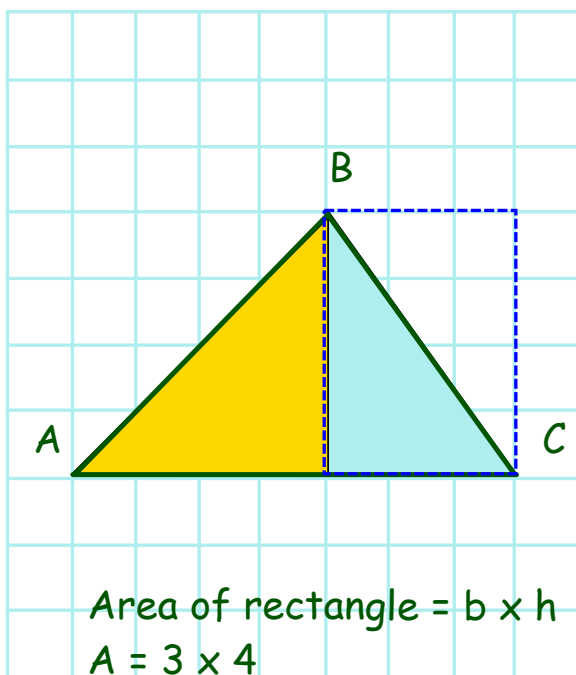
If the area of the rectangle is 16 square units, what is the area of the yellow triangle

?



Step 4

Draw a
rectangle
around the
other triangle.



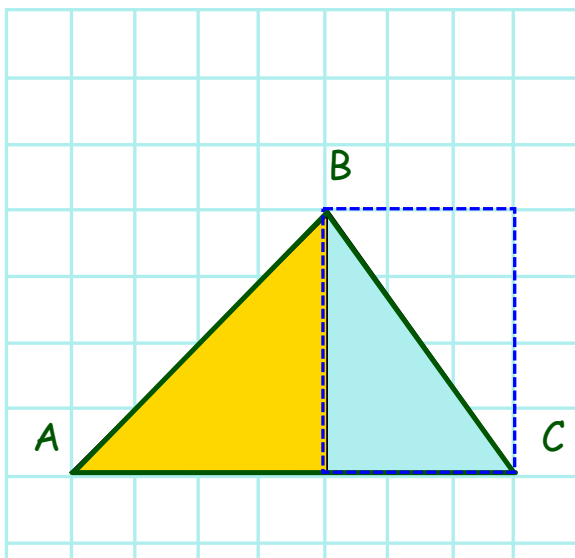
Area of rectangle = $b \times h$

$$A = 3 \times 4$$

$$A = 12 \text{ square units}$$

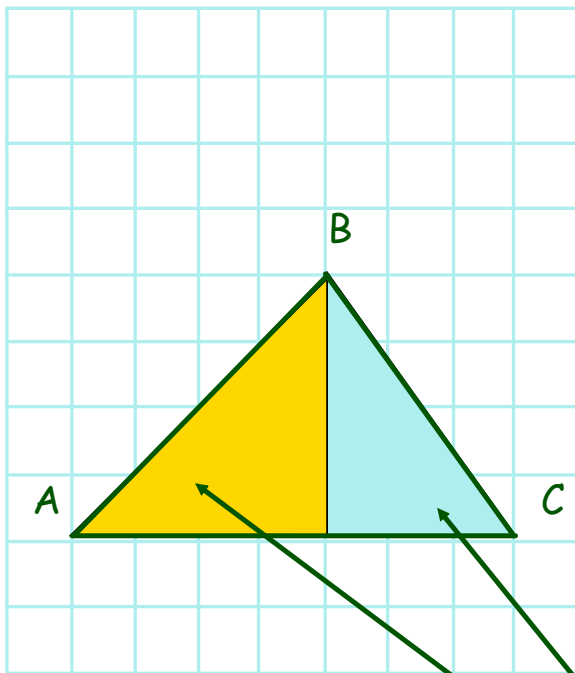
Step 5

Calculate the
area of the
rectangle.



If the area of the rectangle is 12 square units,
what is the area of the triangle

?



Step 6

Now add the two
triangular areas to
get the total area
of the one large
triangle.

Area of large triangle = $8 + 6$
 $A = 14$ square units

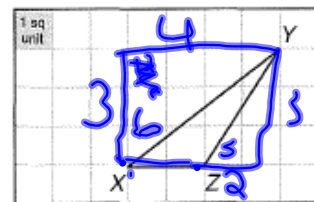


Finding Areas of a Nonrectangular Figures

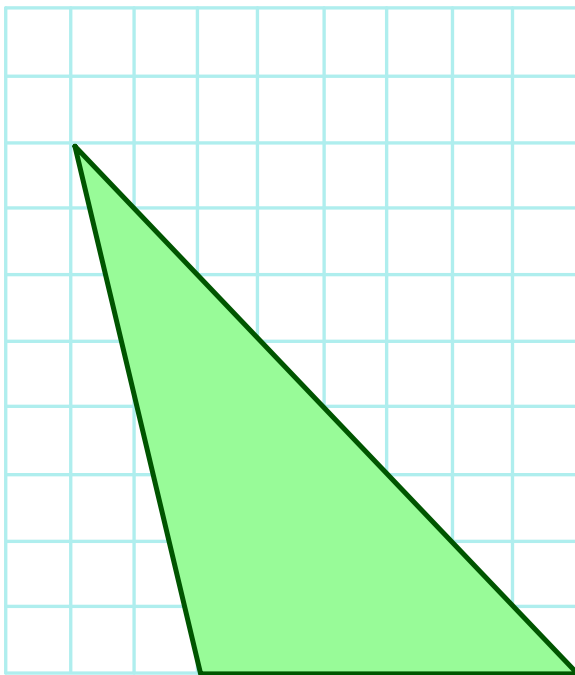
Page 309



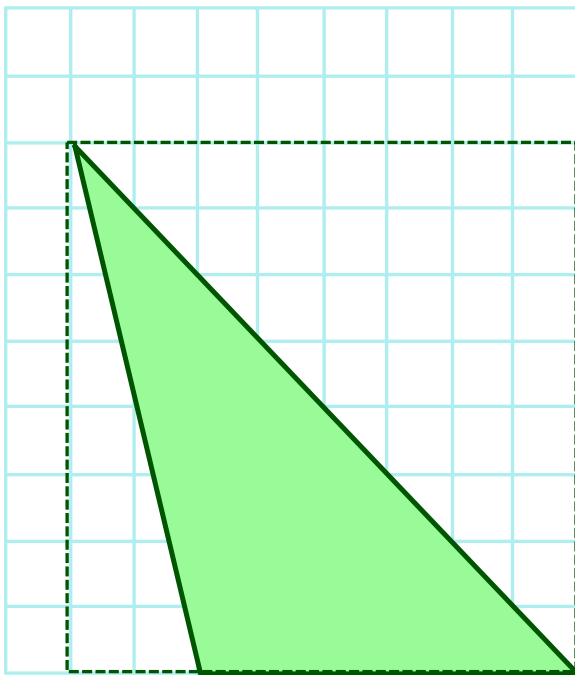
2. What is the area of triangle XYZ?



$$\begin{array}{r} \text{Tot Rec} = 12 \\ \quad \quad \quad 6 \\ \hline \end{array}$$

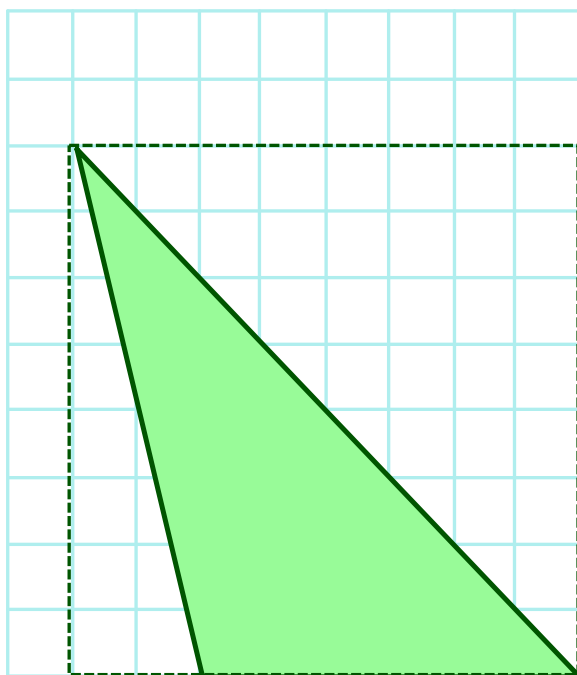


How do we
determine the
area of this
triangle?



Step 1

Enclose the
triangle in a
rectangle

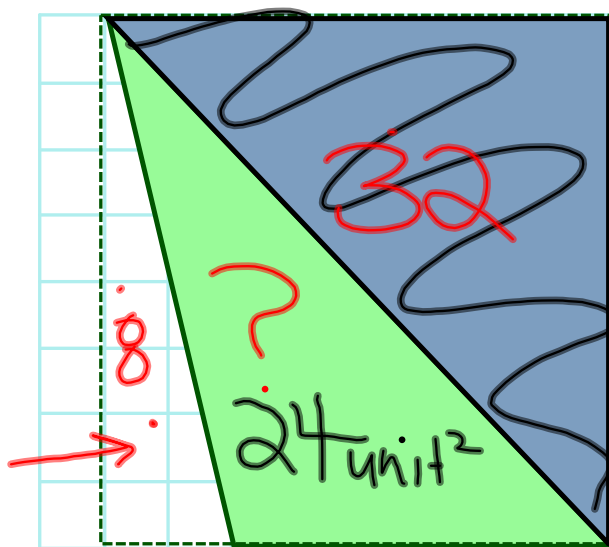


Step 2

Find the area
of the
rectangle

Area of rectangle = 8×8

Area of rectangle = 64 square units



64 = Total Rec.

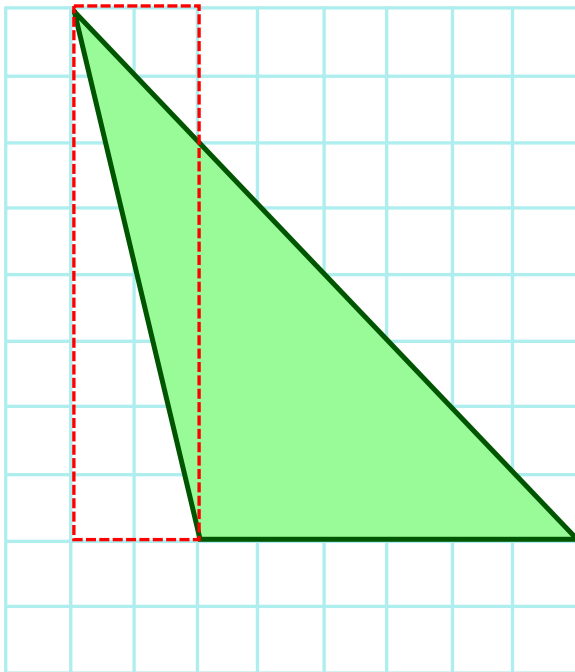
Step 3
$$\begin{array}{r} 64 \\ - 32 \\ \hline \end{array}$$

The blue shaded area is half of the rectangle
$$\begin{array}{r} 24 \\ - 8 \\ \hline 16 \end{array}$$

$$64 \div 2 = 32$$

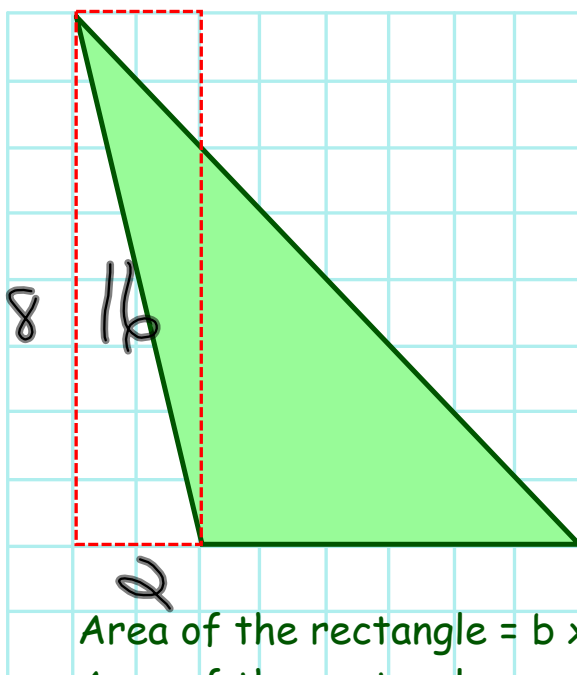
If the area of the rectangle is 64 square units, the area of the triangle

is _____



Step 4

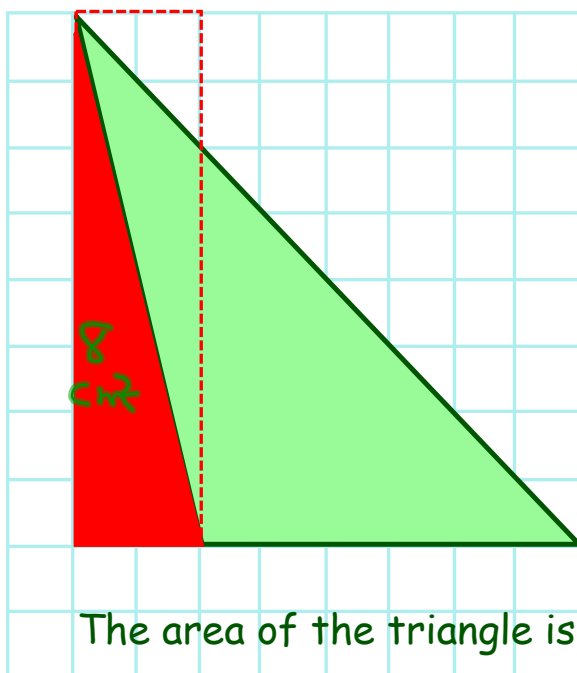
Now construct
a rectangle so
you have a
right angle
that cuts the
rectangle in
half



Step 5

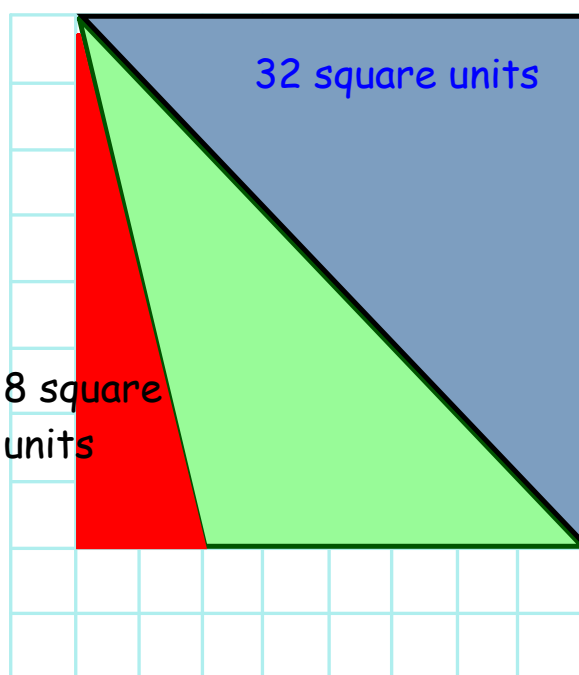
Find the area
of the
rectangle

Area of the rectangle = $b \times h$
Area of the rectangle =



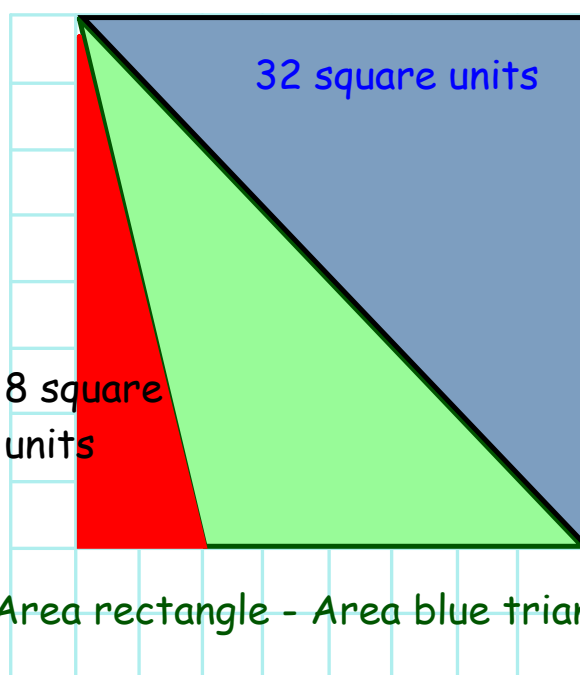
Step 6

Find the area
of the red
triangle



Step 7

To find the area of the original triangle, subtract the two shaded parts from the area of the rectangle



Area rectangle - Area blue triangle - Area red triangle

_____ - _____ - _____

= _____ (area of the triangle in question!)



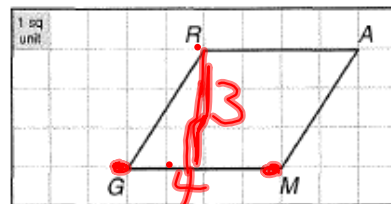
Finding Areas of a Nonrectangular Figures

Page 309



3. What is the area of parallelogram *GRAM*?

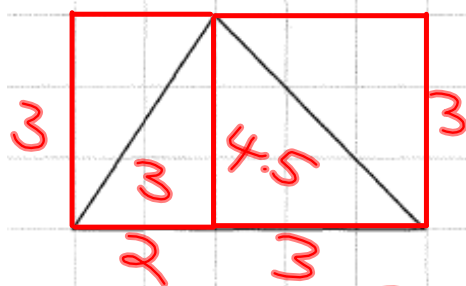
_____ 12 units²





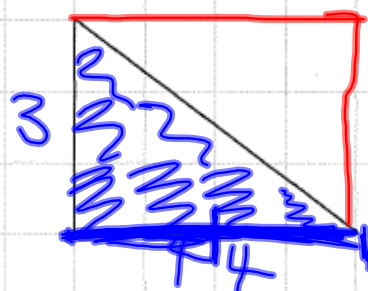
Areas of Triangles and Parallelograms

Page 310



1. Area = 7.5 cm²

7½

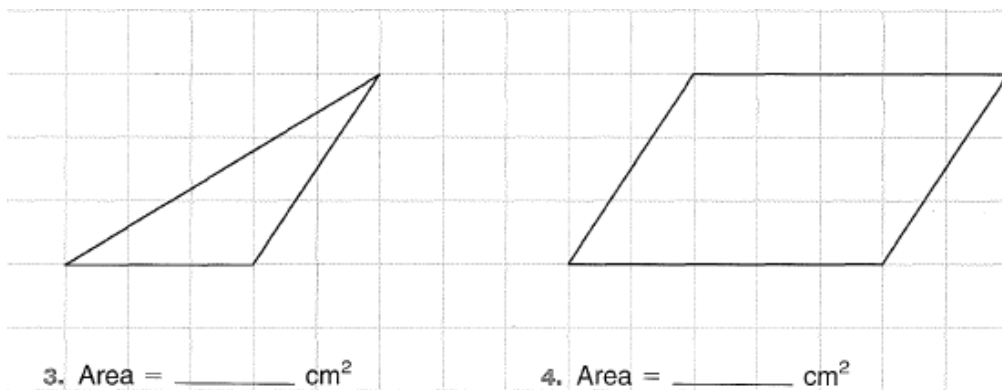


2. Area = 6 cm²



Areas of Triangles and Parallelograms

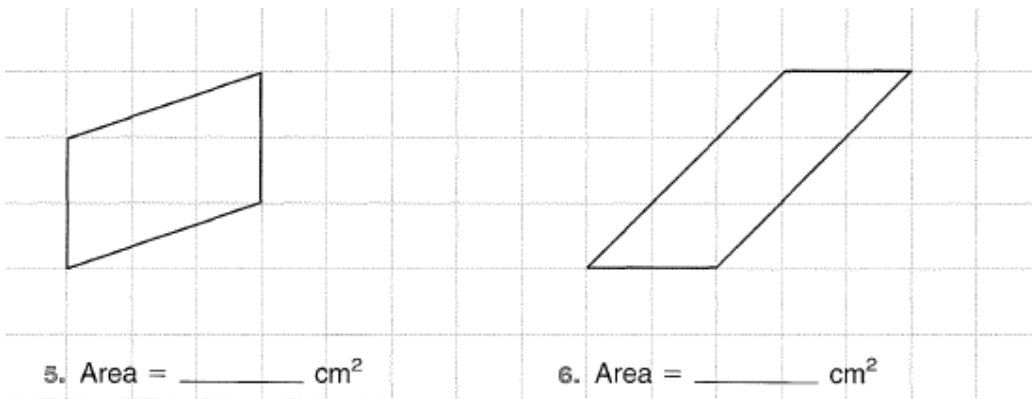
Page 310





Areas of Triangles and Parallelograms

Page 310



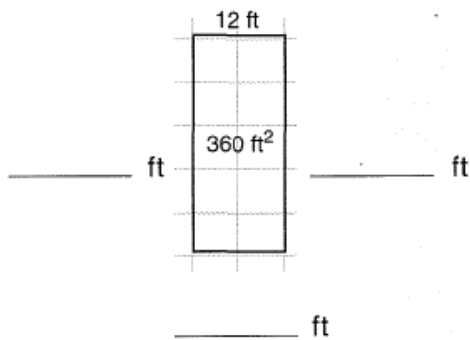


Applying the Area Formulas

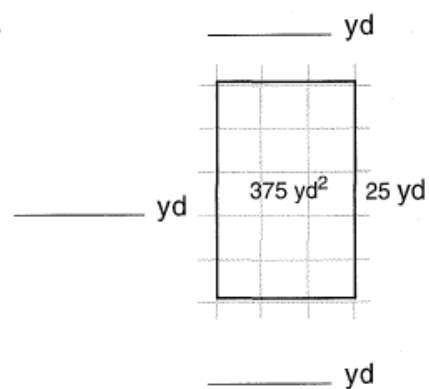


4. Fill in the missing lengths for the figures below.

a.

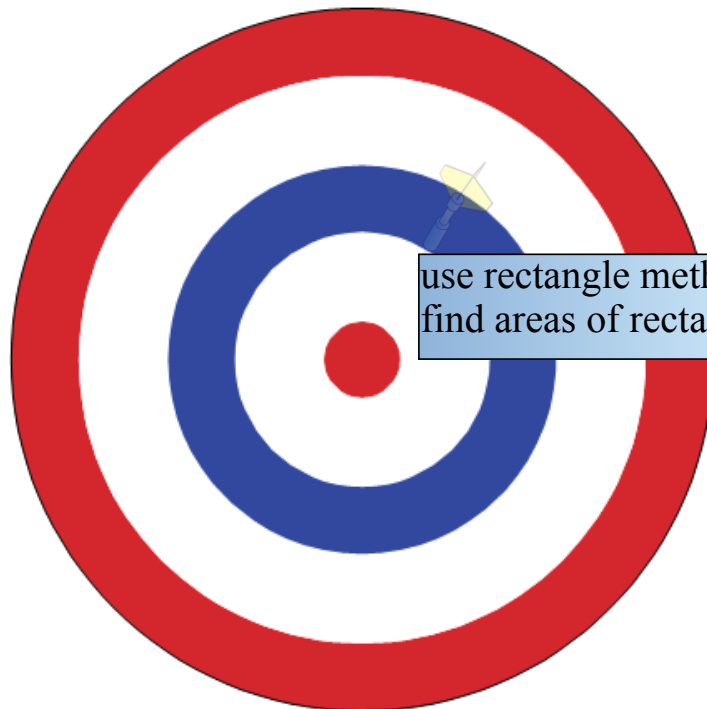


b.





Our goal for today



use rectangle method to
find areas of rectangles

LESSON
9•5
Math Boxes


1. Write the ordered pair for each point on the coordinate grid.

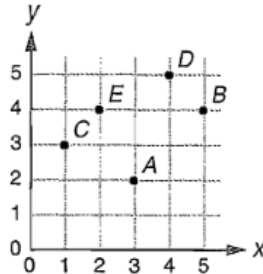
a. A: (____, ____)

b. B: (____, ____)

c. C: (____, ____)

d. D: (____, ____)

e. E: (____, ____)



2. Draw a line segment congruent to line segment AB.



Explain why the line segments are congruent.



3. Complete.

a. 60 inches = _____ feet

b. 3 yards = _____ inches

c. 1 meter = _____ cm

d. 3,520 yards = _____ miles

e. 16 mm = _____ cm



4. Write the following numbers in order from least to greatest.

$\frac{9}{2}$

4.75

$\frac{13}{4}$

4.8

$4\frac{7}{8}$

_____, _____, _____, _____, _____



5. Read the riddle below.

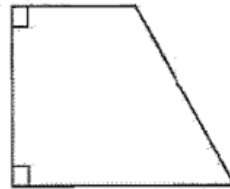
I have 4 sides. I have only one pair of parallel sides. I have more than one right angle. What shape am I?



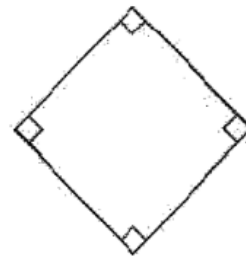
A



B



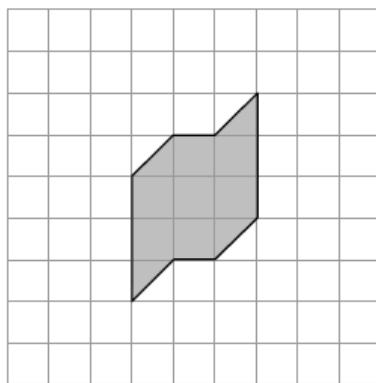
C



D

1 Measurement and Estimation

Use the figure below to answer question 11.



11. What is the area of the shaded figure?

- A 9 square units
- B 11 square units
- C 12 square units
- D 15 square units

2

Measurement and Estimation

12. Don shaded the area of a flower bed on the grid below.



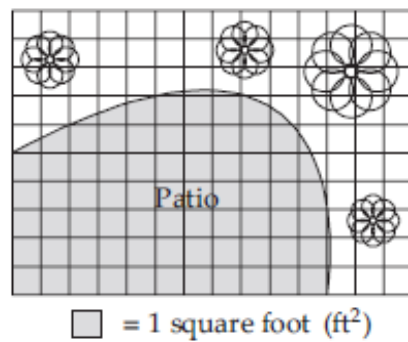
Which estimate is closest to the shaded area?

- A 18 square units
B 25 square units
C 36 square units
D 64 square units



3 Measurement and Estimation

13. Jarel drew a diagram of his backyard on the grid below to show the size of his new patio.



Which is the **closest** estimate of the area of the patio?

- A 50 ft²
- B 70 ft²
- C 90 ft²
- D 110 ft²

4 Geometry

15. Which set of properties describes a rhombus?
- A 4 sides and opposite angles not equal in measurement
 - B 4 sides equal in length and 4 angles equal in measurement
 - C opposite sides equal in length and 4 angles equal in measurement
 - D 4 sides equal in length and opposite angles equal in measurement

5 Geometry

17. Which is a property of all parallelograms?

A 4 equal sides

B 4 right angles

C 2 pairs of parallel sides

D 2 pairs of perpendicular sides

The Rectangle Method



Use the rectangle method to find the area of each figure below.



Example:

$$5 * 3 = 15$$

$$\frac{1}{2} \text{ of } 15 = 7.5$$

Area = 7.5 cm²

1 cm²

1. Area = _____ cm²

2. Area = _____ cm²

3. Area = _____ cm²

4. Area = _____ cm²

5. Area = _____ cm²

6. Area = _____ cm²

Activities

Online Games

Planet Hop



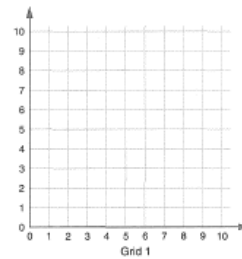
Hidden Treasure EM GAME

LESSON
9•1

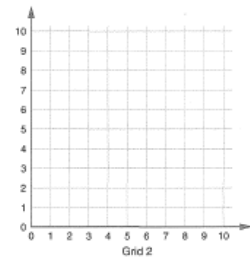
Hidden Treasure Gameboards 1

Each player uses Grids 1 and 2.

Grid 1: Hide your point here.

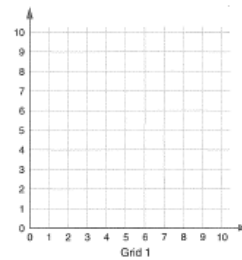


Grid 2: Guess other player's point here.

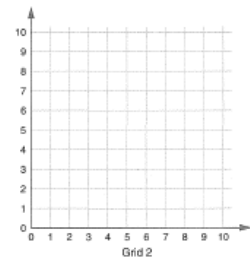


Use this set of grids to play another game.

Grid 1: Hide your point here.



Grid 2: Guess other player's point here.



Attachments

math homework.cil